The Psychology of Auto-Suggestion

Harriet L. Hunt

THE PSYCHOLOGY

OF

AUTO-EDUCATION

BASED ON THE INTERPRETATION OF INTELLECT GIVEN BY HENRI BERGSON IN HIS "CREATIVE EVOLUTION."

ILLUSTRATED IN THE WORK OF

MARIA MONTESSORI

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PREFACE

The material of this book is presented from the stand-point of a practical teacher, not from that of a psychologist.

For many years, the question of training teachers has claimed my most serious thought and effort.

While principal of the training school of Scranton, Pa., where I personally conducted both the theoretical and the practical phases of the work, I demonstrated the possiblity of so training teachers that their first attempts at teaching children would be pedagogical. However, this work was largely intuitional for while it was possible to so train the teachers, I could not tell how I did it. The past two years have been spent in reducing my practice to principles.

In this work, I have been greatly aided by Henri Bergson. For while no pretence of grasping his entire philosophy

is made, I did find his interpretation of intellect and intuition, of consciousness and life most opportunely helpful. And for this, I am most sincerely grateful.

Thanks are due also to William James, whose "Principles of Psychology" was most helpful in regard to the problem of relations and whose "Radical Empiricism", just received, seems to substantiate this theory.

As to the practical application of my theory, I am most deeply indebted to Dr. Maria Montessori for the invention of a material which seems so completely suited to carrying out this theory.

It is my belief that any teacher who can gain such a point of view as that held by Bergson, James, or Montessori can, of her own initiative, organize her class work on the basis of auto-education. But this can not be done on the basis of the old psychology of sensations, perceptions, etc. In order to understand when and how to intervene in the mental processes of the child and when to refrain

from doing so, one must understand the underlying principles which determine the sensations, perception, etc. And in order to appreciate the vital necessity for self-development, one must understand as far as may be, the development of life.

The purpose of this book is to show that this "underlying principle" is the tendency to establish relations, and that the most important fact of life is the fact of a developing form of consciousness.

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CONTENTS

I

THE PSYCHOLOGY OF AUTO-EDUCATION

Since the body, with its brain, is but the manifestation of the life which has formed it, it is clear that a "Scientific Pedagogy" must rest ultimately on a psychology of this life. It is true that "Pedagogical Hygiene", "Pedagogical Anthropology" and "Experimental Psychology" have contributed greatly toward a scientific pedagogy, but these contributions are largely toward the physical development, while the more fundamental problem of pedagogy is the development of life—not alone of human life, but of all life.

The recent interpretations of mental phenomena which are based upon the more intimate knowledge of life as considered in its entire range of manifestations, have incalculable value as applied to education.

In dealing with intellect, the knowing element in consciousness, psychology has focussed attention almost exclusively upon the images of objects which so largely constitute the "stream of consciousness". But we are conscious of something beside these images of objects. For example, I have an image of this paper, but the paper is on the desk, and I am conscious of that space relation, *on;* I am writing on the paper *now*—a time relation; the ink is blue, i. e., it is like my mental standard of blue—a relation of *likeness;* I am writing with my pen, but it belongs to a class of tools called pens—*a relation of the particular to the general;* I see the ink in my pen, it stays there until the pen is pressed upon the paper when it flows out forming the letters—*a relation of cause and effect.* Besides the images of objects, then, we are conscious of the relations of space, time, likeness, difference, cause and effect and the particular to the general. And there are other kinds of relations but they will not be considered here.

It has been said that gaining knowledge is seeing relations, and we must take account of this fact of relating.

In his discussion of intellect, Bergson distinguishes between that which is given by the perceptive faculties, namely, sensations, perceptions, ideas, etc., and the tendency to establish relations. The former constitutes what is called the "matter" of knowledge; while the latter, the tendency to establish relations, is the "form" of knowledge. The form, the tendency to relate, is innate, inherited, while the matter, the sensations, perceptions etc., are acquired. "The newborn child," says Bergson, "so far as intelligent, knows neither any definite object nor a definite property of any object; but its intelligence makes use of like with like, cause and effect", etc. In this way, a body of knowledge is acquired.

This discrimination between the form and the matter of knowledge has an important bearing upon the method of education. The tendency to establish

relations which underlies sense perception, and which is innate and so acts of itself, is one of the most important principles underlying auto-education.

In his "Play of Animals and Man", Groos speaks of the "hunger of the senses". In the same sense, there is a hunger of the relating tendencies. Especially may this be seen in reference to space relations. When a child begins to handle blocks, shells, or other small objects, his interest in mere position—a space relation—is clearly seen. This may be illustrated by the little girl of eighteen months who would entertain herself for twenty minutes at a time by merely moving her shells one by one from the sand pail to the wheel barrow, then back to the pail and so on. This little girl used her building blocks in the same way, but at this period nothing could induce her to build with them; relative position, the necessary relation in building, came later. A little boy of four years, whenever he heard the size of an object mentioned as, for instance, if his mother were

to say, "Mary was eating a large apple," would say, "Well, mamma, was it as large as my ball?", showing his immediate interest in the space relation of relative size.

The phenomenal success of the Montessori Method is due to the fact that the material makes its appeal directly to this tendency to establish relations, and so meets the child's first needs in his efforts to grasp the meaning of his environment. The child does get sensations through the material, to be sure, but these interests are subordinate to the greater interest afforded by the impulse to relate. This fact shines out from all the pages of Montessori's great work, "The Montessori Method", although it is not reflected from her consciousness. For instance, in the chapter on "Sense Training," page 169, she says:

"With the normal child it (the didactic material) provokes auto-education.

"This fact is one of the most interesting I have ever met with in all my experience, and it inspired and rendered possible

the method of observation and liberty.'

Illustrating this she continues:

"Let us suppose that we use our first object—a block in which solid geometric forms are set. Into corresponding holes in the block are set ten little wooden cylinders, the bases diminishing gradually about ten millimeters. The game consists in taking the cylinders out of their places, putting them on the table, mixing them, and then putting each one back in its place. The aim is to *educate the eye to the differential perceptions of dimensions.*"

Although Montessori's "aim" may be to train the sense of sight through the medium of this game, it is very evident that the child's aim in using the material is to satisfy his "hunger" for the space relations of position and of relative size. This view is further borne out by the account on page 233 of the succeeding lesson on this material, which is as follows:

"The directress, after the child has played for a long time with the three sets of solid insets, and has acquired a

security in the performance of the exercise, takes out all the cylinders of equal height and places them in a horizontal position on the table, one beside the other. Then she selects the two extremes, saying, 'This is the thickest—This is the thinnest.' She places them side by side so that the comparison may be more marked, and then taking them by the little button, she compares the bases, calling attention to the great difference. She then places them again beside each other in a vertical position in order to show that they are equal in height, and repeats several times, 'Thick—thin.' Having done this, she should follow with the test, 'Give me the thickest—Give me the thinnest,' and finally she should proceed to the test of nomenclature, asking, 'What is this?' In the same way the directress proceeds with other cylinders, calling attention to 'highest' and 'lowest', 'largest' and 'smallest'."

The child, according to Montessori's account "takes spontaneously a lively interest" in this game, "pushing away all

who would interfere, or offer to help him," wishing "to be alone with his problem."

The joy of exercising the relating tendencies is clearly evident in this exercise, and indeed Montessori says herself of it, "There is, therefore, no question here of teaching the child the *knowledge* of the dimensions, through the medium of these pieces.

"Here it is instead, the work of the child: the auto correction, the auto-education which acts for the teacher must not interfere in the slightest way."

One has only to observe the child in his play with this material to see that "the auto-education that acts" is the tendency to establish relations. In his play with these objects the child is constantly sensing the likenesses and differences in size and the space relations of relative size. After these relations have become fairly established, the names are given. Many other illustrations bearing on this point could be cited. Indeed, the important characteristic of the Montessori Method is to present "few con-

trasted stimuli", wait until the child has established the desired relations and then give the name.

The foundation for the conceptual relations which is established by this system is of inestimable value to the child. The following reference to nomenclature is interesting because of its bearing upon these relations:

"This (nomenclature) is one of the most important phases of education. Indeed, nomenclature prepares for an exactness in the use of language which is not always met with in our schools. Many children, for example, use interchangeably the words thick and big, long and high. With the methods already described, the teacher may easily establish, by means of the didactic material, ideas which are very exact and clear, and may associate the proper word with these ideas."

Discriminating through the medium of this material the exact space relations of "thick and big", "long and high", etc., and learning the names that apply to these relations, enables the child to exer-

cise this same relating activity in connection with the objects of the environment, and the subsequent use of these terms as applied to the environment shows the development of the generalizing activities. An illustration of this is given by Montessori in connection with her remarks on the generalization of ideas.

"There will be children who, after having touched a few times the stuffs, or merely the smooth and rough cards, will quite spontaneously touch the various surfaces about them, repeating 'smooth', 'rough', it is velvet', etc. 'We must await this spontaneous investigation of the surroundings, or as I like to call it, this voluntary explosion of the exploring spirit.

"The teacher should watch with the most solicitious care to see when and how the child arrives at this generalization of ideas. For example, one of our little four-year-olds while running about in the court one day suddenly stood still and cried out, 'Oh! the sky is blue!' and stood for some time looking up into the blue expanse of the sky."

This illustrates perfectly the fact that the tendency to establish relations is the principle underlying auto-education. The child saw the likeness between the sky and his mental standard of blue and so could teach himself the color of the sky; i. e. the development of his relating power produced an alertness and activity of mind which compelled new discoveries—this is auto-education.

There is nothing mysterious about auto-education if the teacher only focuses her attention upon the tendency to relate, which the child begins to exercise at birth, instead of on the conscious elements of sensations, images of objects, etc., which the child has to acquire.

It is claimed that the children themselves, through their interests, have determined the sequence in which the material is presented. No doubt the relative time of the development of the relating tendencies has determined for the child his interests.

While the illustrations cited above show than an appeal is made by this material

to the relating tendency, the method used by Montessori in teaching the representation by figures of the number ten (a point which has to be taught independently of the material), shows that she has not yet grasped the idea of this tendency.

Counting beyond ten is carried on by the "Long Stair" rods. The lesson in which the children are taught to represent the numbers which consist of two places, units and tens, begins as follows on page 336, of "The Montessori Method":

"Counting along the rod as far as nine, there remains this one section which, as there are no more numbers, we again designate as 1; but this is a higher 1 than the first, and to distinguish it from the first, we put near it a zero, a sign which means nothing."

The reason for using the figure 1 to designate the ten is not a matter of cause and effect "because there are no more numbers" (figures), but it involves a relation of likeness leading to a relation of the particular to the general. The

rod is composed of ten sections and is now to be considered *a ten*. This 1 ten, the same as in the case of 1 child, 1 class, 1 army is to be designated by the figure one. The oneness of the 1 ten, 1 class, 1 army, etc. is to be classed with the oneness of the 1 unit, 1 house, 1 chair, etc. Then follows the cause and effect that in order that we may know whether the figure 1 means 1 unit or 1 ten, we give each its place. If we have only 1 ten with no unit, we place the naught in units place. Instead of meaning "nothing" this naught has a very definite meaning, which is that there are no units.

These relations are easily worked out by children at this period and are not only extremely interesting to them, but are most significant as forming the basis for all further auto-education in numeration and computation.

As an illustration of the wonderful effect produced by training the relating tendencies, an incident from the experience of Miss George may be given. The exercise in filling in with the colored

crayon the outlines of the mental insets, preparatory to writing, was in progress. A little girl had on her paper the outline of a square frame in which was another outline of a smaller square to be filled in with a color to be chosen by the child.

The only direction given the children was, "Do not go outside the lines with your crayons."

The little girl in question chose what proved to be an ugly orange color, which she proceeded to "lay on" with vigorous strokes mostly curved in direction. The result was a thick mass of dirty color which did not fill the space.

No word of criticism on her work was made, nor were any suggestions as to color or stroke given. The child proceeded according to her own idea, and after six or eight designs had been filled in, each of which was an improvement upon the preceeding one, produced a design which was beautiful and delicate in color, being a light green in the center with a corresponding light pink frame,

and having a smooth and even surface with the downward parallel strokes.

In her first attempt at filling in, the impulse to "lay on" the color swamped her intellect. The charming bit of auto-education which followed lies in the fact that (1) previous exercises in telling likeness and difference in color had, in training the power to relate, brought to her attention colors which appealed to her sense of beauty; (2) the exercise of the relating tendency with regard to space relations of rough and smooth, as given on pages 185, 186 "The Montessori Method," had acquainted the child with surfaces, enabling her to descriminate a smooth, even surface.

The training of the relating tendencies in regard to likeness and differences in color and in regard to space relations of rough and smooth surfaces provided the means for a self-education, which in this instance seems truly wonderful.

Beside the indefinite space relations of long, large, heavy, etc., which are gained through means of the Montessori material,

there are the various definite space relations such as, yard, quart, pound, etc. which are to be gained through the use of the measures of the denominate number tables. In following its natural tendency to relate, the mind needs these standards of measurements, and attention to the problem of acquiring them should succeed the Montessori work.

There is only one method of gaining knowledge, and that is through the establishment of relations. This fact must be recognized in the higher as well as the lower grades. A thorough comprehension of how this principle works would go far toward enabling teachers to adopt, through their own initiative, the method of auto-education.

It is impossible, however, successfully to train teachers in the method of auto-education from the standpoint of the content of knowledge alone. Until one gets down to the activity itself, by which this content is acquired, the problem of "direction" (teaching) is involved in mystery. Only that psychology which

takes account of the tendency to establish relations is adaquate to serve as the basis of auto-education.

II

CONTENT OF KNOWLEDGE

But it is not alone the recognition of the form of intellect that characterizes the psychology of auto-education, but the new meaning which has been given to the content of knowledge is to be considered as well.

Sense training is, indeed, an important matter, but this sort of training has a limit, and this fact raises the question of what is to follow sense training.

We are familiar with the psychology that, beginning with sensation which gives us a knowledge of the properties of objects, passes on to perception which gives the knowledge of whole objects and so on to conception which gives us the knowledge of classes of objects. But in order to get the real meaning of life and mind, we must realize that animal life taken in its entirety, exhibits just these

same stages in a *developing form of consciousness*. It is this fact of a developing consciousness that gives significance to sense training. A brief statement based upon Romane's "Essay and Origin of Human Faculty" will explain what is meant by a "developing consciousness".

Mention was made above of our consciousness of images and their relations. Comparing this human grade of intellect with that of the animals next below ourselves, the mammals, birds, frogs, and fishes, we are forced to conclude from the acts of these animals, that they, too, have images of objects and, to an extent, of their relations; e. g., the fish, which is the lowest of the vertebrates, can be trained to distinguish between pieces of rice paper dyed pink, which are its food, and pieces of ordinary white paper, so that when both are put into the water at the same time the fish will choose the pink. This shows what Romanes calls a "sort of outward generalization"—a tendency to relate the particular to the general. This process is similar to our

own act of generalization, although in the lower animals mentioned above, it is limited to the objects which are present to the senses. These animals cannot image objects which they have never seen; and also not having language by which the generalizing or conceptual power, as it is called in its perfected state, is greatly extended, these lower animals lack the element of self-consciousness. Through this power, man looks upon his inner world of images, ideas, concepts, as the animal looks upon the outer world. Man's knowledge is not limited to the things he *has seen:* with the system of words, which are symbols of things, he arrives at the knowledge of things he *has not seen.* Man knows things by classes. This is the conceptual grade of consciousness. The higher animals are conscious of objects as individuals, which is the perceptual grade of consciousness.

Considering now the lowest forms of life, the one-celled microscopic forms, such as bacteria, the familiar amoeba, and the like, we find that, though through-

out life they are only microscopic cells of protoplasm, yet each has a consciousness. The amoeba has the consciousness of touch, for if touched, it will move. It is sensitive also to light, heat, and chemical forces, which indicates the presence in consciousness of other sensations beside that of touch. These animals are conscious of the properties of objects—not of whole objects. This is the sensation grade of consciousness.

It has not always been allowed that these lower forms of life have consciousness. In fact, Descartes and other philosophers have maintained that these animals were mere automata. But how does one know that another *person* has thoughts and feelings? If a person were to lie perfectly motionless for a period of days, supposing such a thing possible, one would judge him to be unconscious, though he might be engaged in very active thinking. The only reason for supposing that other persons have thoughts and feelings similar to our own is because under similar circumstances they act as

we do; we judge of their thoughts by what they do. In the same way, judging by the behavior of the lower life forms, we conclude that consciousness does exist in the form of simple sensations; although just what a consciousness consisting of sensations alone without giving images would be like, it would be difficult for us to imagine.

The first manifestation of sensory consciousness is undoubtedly the sensation of touch. Then other sensations, such as taste, smell, vision of light and darkness are added; or rather, unfolded from the mind, for all of the forms of consciousness are peculiarly the gift of the mind, as Edward Carpenter so beautifully shows:

"Everyone," he says, "has experienced the magic of the musician, that out of three sounds he frames, not a fourth, but a star. The three first notes are mere sounds, noises; but with the fourth, the phrase, the melody, the meaning descends upon us from within. An answer comes from the background of our

minds, which transforms mere noise into music.

"So it is with the mind of the lowest life forms of a single cell, perhaps the sense of touch has awakened within it, but no more. Presently another sensation of touch and many more, but still no growth of consciousness. Then one day the sense of likeness between them arrives. And it arrives from *within*. The mind of that cell has reached the degree of consciousness represented by the perception of likeness and difference."*

From such seemingly small beginnings consciousness has developed through the various grades of sensation, perception, and conception.

In the knowledge given by each succeeding grade of intellect, there appears an ever increasing unity. The sensational grade gives the knowledge of the properties of objects, the perceptual grade gives the knowledge of whole objects,

* *Note.* This quotation seems to give a sense of self-development, not necessarily an accurate statement of the order in which mental processes develop.

while the conceptual grade gives the knowledge of classes. Beyond this last grade, however, is one other and greater unity—the union of all classes of objects, the cosmos. Is there any grade of consciousness which gives this unity? Undoubtedly there is, although it may not be through intellect alone that it is known.

"By intuition, we come to a knowledge of the universe as a whole and to our own identity with this whole and a sense of kinship with all life." This form of consciousness is called the "Cosmos Consciousness" by Edward Carpenter, who says:

"Of the existence of this form of consciousness there is evidence all down history; and witnesses, far removed from each other in time and space and race and language and perfectly unaware of each other's utterance, agree so remarkably in their testimony that there is left no doubt that the experience is as much a matter of fact as any other human experience, though the capacity for it is, of course, not universal. But it is not

only the great prophets and seers who prove to us the existence of this stage of consciousness. For to almost all mankind, flashes of the same thing come in those moments of exaltation of intuition which form the basis of religion, art and music."

In both the ancient and modern drama, we find instances of the cosmic consciousness portrayed, for example, in the Hindu drama "Sa Kuntala", and in the drama of "Peleas and Melisand" by Maeterlinck.

While Edward Carpenter's "Art of Creation" gives an exceedingly interesting account of the cosmic consciousness, it is in the "Creative Evolution" of Henri Bergson that we find the most scientific treatment of the subject.

In order to get the full meaning of Bergson's idea, however, one needs to realize more fully than ordinarily the part that life plays in the environment. Let me, therefore, call attention to a few facts concerning life.

Think for a moment what life can do! Here, we will imagine, is a speck of pro-

toplasm, the material out of which the living parts of all animals and plants is made. It is so tiny that it has to be magnified many times before it can be seen. It is called a cell, not because it is hollow like the cell of a honey comb; it is a tiny mass answering more to the honey in the cell of the comb. This cell of protoplasm may be one of the cells of a growing bone or of a muscle, or it may be a nerve cell, for the body is built up in part by just such cells. Again this particle may be the cell of a dog, of an oyster, or of a tree or mushroom, or it may be a tiny microbe of typhoid fever, or an amoeba living with other microscopic animals and plants out in the lake. It may be any of these or a host of things not mentioned; but whichever it is, wherever it is found, it has the same general characteristics. This little speck of protoplasm—this cell—has life and because of this, it can do certain things.

Protoplasm can move of itself in any direction, even contrary to gravity; it can take in dead matter which is its food

and separate the chemical constituents of such food stuff, recombining the molecules so as to form more protoplasm; then this protoplasm can form other substances like muscles, skin, bones, or wood and other plant tissues. Life in the protoplasm directs the chemical forces, making and unmaking compounds of molecules.

Think of the part life has played in directing the forces of nature so as to build up the complex forms we see about us. Consider for a moment the things in an ordinary living room. The carpet on the floor, every fibre, every thread and every particle of lint in it was once living protoplasm in some plant or animal; the floor under the carpet, every particle of it was once living protoplasm in the body of some tree; every article of furniture, all the draperies, the paper on the walls, all were once living protoplasm. Even the plaster on the walls was once living in the bones, shells, and other hard parts of animals. Again, think of the city, the houses, street cars, wagons; the material of each was once, in great part, living

protoplasm. We are accustomed to look at these objects as so many material things which minister to our comfort or discomfort, but what I wish to point out is that all these things are the manifestations of life—have been built up molecule by molecule by life, by that mighty impulse with which life moves through matter. The material of these things has been organized or built up by the life of the cell, and then this material has been used by man in manufacturing tools, houses, and other things.

According to Mr. Bergson, "Life, that is to say, consciousness launched into matter," organizes matter, i. e., it builds up the bodies of animals and plants. Now, in this process of the organization of matter by life, there are two kinds of things to know: first, the matter as organized; and second, the movement of life in the act of organizing. The necessity of attending to these two phases has resulted in splitting consciousness into intellect, which knows matter; and intuition, which knows life.

For reasons which I will not enter into here, "intuition, which seems preferable to intelligence" has developed along the line of instincts. While this line gives a very narrow range of knowledge, in some instances the knowledge seems marvellous. This is shown in insect life, where instinct seems to have found its culmination. The insect, for example, that stings its prey (the larva of another insect) in those nine motor nerve centres, which paralyzes without killing, and so furnishes fresh meat for its own larva, knows the place to sting, as Bergson says, "by an intuition which is probably like what we call divining sympathy".

On the other hand, "Consciousness in man", says Bergson, "is pre-eminently intellect. It may have been, it ought, so it seems, to have been also intuition." Intuition and intellect represent two opposite directions of the work of consciousness: intuition goes in the very direction of life, it knows the organizing process—it knows life from the inside; intellect goes in the opposite direction and knows

matter after it has been formed. "A complete and perfect humanity," continues Bergson, "would be that in which these two forms of conscious activity should attain their full development." We, as human beings, have intuition, but it is vague and "above all discontinuous". "It is a lamp almost extinguished, which only glimmers now and then for a few moments at most. But it glimmers wherever a vital interest is at stake. On our personality, on our liberty, on the place we occupy in the whole of nature, on our origin and perhaps also on our destiny, it throws a light feeble and vacillating, but which none the less pierces the darkness of the night in which the intellect leaves us.

"These fleeting intuitions philosophy should seize: first to sustain them, then to expand them and so unite them together. The more it advances in this work, the more will it perceive that intuition is mind itself, and in a certain sense, life itself."

Intuition, as "divining sympathy", is

the way of knowing which is characteristic of instinct and is therefore common to all animals. But the bodies of animals are so fashioned that they can use only an infinitely small number of objects and therefore their knowledge is extremely limited. "Consciousness is held in a vice," says Bergson.

Intelligence, on the other hand, has a brain that can build an unlimited number of motor mechanisms and a body that can use these mechanisms, in reacting to any number of things and so can overcome all obstacles. In this, consciousness has found its freedom to develop.

While intuition seems to have waned during this progress of intellect, great possibilities for it have accumulated through the development of intellect i. e. through the accumulation of ideas and concepts. We seem now to be approaching the time when the two streams, intellect and intuition, shall merge again in one as they were merged in the beginning—through with their potentialities now partially realized. This merging is

the problem of the developing consciousness. How is it to be achieved?

We are not left by Bergson without suggestions concerning this. By a kind of "sympathy" the insect knows the one object and how to treat this one object, which is to be the food for its young. "If this sympathy could extend its object and also reflect upon itself, it would give us the key to vital operations—just as intelligence, developed and disciplined, guides us into matter." Instinct does not reflect, does not form concepts, is not self-conscious. By human intuition Bergson means "instinct that *has* become self-conscious, capable of reflecting upon its objects, and of enlarging it indefinitely" —that is of applying this knowledge to other things. The artist who seeks to know the *intention of life* that runs through the features if his model by placing himself back within the object by a kind of sympathy, exericses this intuition, in a measure. "An inquiry turned in the same direction as art, which would take life *in general* for its object would, through this intuition,

enable us to grasp what it is that intelligence fails to give us." "Then, by the sympathetic communication which it establishes between us and the rest of the living, by the expansion of our consciousness which it brings about, it introduces us into life's own domain, which is reciprocal interpenetration, endlessly continued creation. But though it thereby transcends intelligence, it is from intelligence that has come the push that has made it rise to the point it has reached. Without intelligence, it would have remained in the form of instinct, riveted to the special object of its practical interest." Herein lies the significance of a developing consciousness.

Intelligence, working its way up to freedom through the grades of sensation, preception, and conception, meets again the question of the stream of life, but having freed itself, in a measure, from matter through its conceptual activities, it can now, as Bergson says, "turn inward on itself, and awaken the potentialities of intuition which still slumber within it."

Intelligence, then, developed to its farthest extent gives intuition the opportunity to establish a "sympathetic communication between ourselves and the rest of the living", and by so "expanding our consciousness", brings us to the knowledge of life itself.

Undoubtedly, the work of education, then, is to develop an intellect that can "give the push". Here again, suggestions from Bergson are not wanting.

The superiority of man's consciousness over that of animals is due, he says, to three things: first, to a brain which enables man to build an unlimited number of motor mechanisms with which to react to the things of the environment; second, to language (concepts), which partially frees man's intellect from material things; third, "to social life, which stores and preserves efforts as language stores and preserves thought, fixing thereby a mean level to which individuals must raise themselves at the outset, and by this initial stimulation prevents the average man from slumbering and drives the

superior man to mount still higher. But our brain, our society, our language are but the external and various signs of one and the same internal superiority. They tell, each after its manner, the unique, exceptional success which life has won." Here is the very essence of the doctrine of auto-education.

The brain, a physiological instrument both formed and used by life; language, an immaterial instrument fashioned by life and used for the expression and storage of ideas; and society, instituted by life for the storage of efforts—with these accomplishments to its credit, may we not trust life to educate itself? All education is, of necessity, auto-education. The work of the teacher is that of direction, first, through the means of a suitable environment; and second, through direct appeal to the mind.

The three things mentioned above, brain, language, and social life, discover to us the paths by which the young are to be guided to greater achievements. First, there must be the physiological

development of the brain and body; second, there must be opportunity for the exercise of those impulses to activity which seize upon the "efforts stored by society"; third, intellect must be led to freedom through means of language (concepts) from a knowledge of things seen to a knowledge of things not seen.

With regard to the first, we must look to "Pedagogical Hygiene," "Pedagogical Anthropology" and "Experimental Psychology". As to the second, the child is a "consciousness launched into matter", and the impulses due to this impulsion are vital to development; the material impulses building its body, the personal impulses determining its individuality, and the social impulses appropriating and continuing the efforts of preceeding generations. Our more immediate concern here is with the third, the intellect.

Sense training is the first step toward this unfolding of intelligence, and while this step is very important it must soon be followed by the more important problem of developing the conceptual form of

consciousness which constitutes the strictly human grade of intellect and is the path by which consciousness frees itself.

As sense training is accomplished through the tendency to establish relations, so the training of the conceptual power is determined in the same manner. It was stated in the beginning that the initial step in conception is nomenclature—learning the names of things seen; but as this knowledge advances, the relating of like with like, of the particular to the general and of cause and effect, makes possible a knowledge of things unseen—such for example as geographical and historical knowledge. This relating, like that in sense-training, is to be carried on as far as possible as a matter of auto-education. This would be determined by the environment provided and by the method of directing the psychic activity.

The fact of thus developing the conceptual form of consciousness through means of the establishment of relations, gives meaning to the otherwise unintelligible opening paragraphs of Montessori's

chapter on "Intellectual Education", where she says: "The sense exercises constitute a species of auto-education, which, if these exercises be many times repeated, leads to a perfecting of the child's psycho-sensory processes. The directress must intervene to lead the child from sensations to ideas—from the concrete to the abstract, and to the association of ideas. For this, she should use a method tending to isolate the inner attention of the child and to fix it upon the perceptions—as in the first lessons his object in attention was fixed, through isolation, upon single stimuli.

"For this, knowledge of a special technique is necessary. The educator must, '*to the greatest possible extent, limit his intervention; yet he must not allow the child to weary himself in an undue effort of auto-education.*'

"It is here, that the factor of individual limitation and differing degrees of perception are most keenly felt in the teacher. In other words, in the quality of this intervention lies the art which makes

up the individuality of the teacher."

"To lead the child from the education of senses to ideas" as Montessori quotes from Seguin, does indeed, require a "special technique", but *what is this "special technique"?*

I fail to find any explanation in the writings of Montessori that would help a teacher to gain this much-to-be-desired technique. To possess it or not to possess it is a matter of "individuality" in the teacher, according to Montessori. The question of when and how the teacher should "intervene" to lead the child from "sensations to ideas" is perfectly clear and simple, however, when considered from the point of view of the tendency to establish relations, as will be shown in Part III, but it can not be explained on the basis of the old psychology.

A psychology that is adequate to explain auto-education must first describe the process by which the content of knowledge is acquired; and second, it must define the relation and meaning of human consciousness in regard to all life.

Above all others, the teacher is one whose mind should be "set in the direction of life"; she should know life as well as matter, and though she may not achieve the great "divining sympathy" which is "intuition", she should know that such a form of consciousness exists and that all human life is working toward that goal.

This is what Montessori calls the "spirit" of the teacher. "We must make of them (teachers) worshipers and interpretors of the spirit of nature." This cannot be done so long as life is thought of as consisting of unrelated groups of individuals. If a teacher does not herself possess intuition in some degree, she can be prepared in "spirit" only as she comes to know the significance of a developing consciousness—the meaning of all life.

The tendency to establish relations is the form of self-activity which, if recognized and directed both in its early and later stages, will lead, through sensation and preception to a grade of intellect far superior to that which is now produced—even, peradventure, to intuition.

III

LEARNING AND TEACHING FROM THE POINT OF VIEW OF ESTABLISHING RELATIONS

The real significance of a psychology that recognizes a developing consciousness and that discriminates between the form and the content of knowledge is to be seen in the application of these principles to teaching.

Such intuition as Montessori has shown in developing her method of auto-education is of rare occurence; however, through the intellectual approach to the subject something akin to this intuition may be achieved by those who greatly desire it. Certainly to have thought out clearly what the processes of learning and teaching are, is one step toward directing such processes. While a Scientific Pedagogy must, indeed, rest upon the observation of children developing under conditions of freedom, it is extremely important

that these observations be interpreted ac-according to the most advanced psychology.

Such a general statement as, "The tendency to establish relations is the fundamental principle of auto-education," is of little use as an aid to teaching until this principle has been analyzed. In order to apply this principle in teaching the process of establishing relations must be described, as also the method of directing this process.

There are various kinds of relations which things sustain to one another. Among those to be considered here are relations of space, time, likeness. difference, the particular to the general and cause and effect. Space relations are expressed by such words as on, under, between, larger, foot, inch, quart, pound, etc; time relations by such words as early, year, day, before, four o'clock, etc. Examples of the other relations will readily occur to one.

The sensing of a relation is a peculiar experience. Take for example, the word

beside. What is there in the material world that answers to it? You sit *beside* your friend. What does the word mean? Clearly, nothing apart from the two persons. How, then, can it be sensed? This is the way the mind does it. The attention is focussed first upon the friend, we will say, then upon one's self, passing alternately from one to the other several times; the effect of this passing is the awareness (i.e. the sensing) of the relation. Again, suppose one were askèd, "How long are the lead pencils used in school?" Immediately the standards of long measure come to mind; attention is focussed upon the mental image of the length of the pencil and then upon the mental standard of inches following which the mind judges, "Pencils are six inches long." Relations of likeness and difference are sensed in a similar manner. For example, in telling a color, the child focusses attention alternately upon the color seen, then upon his mental standards of color, naming the color according to the likeness perceived.

With respect to the relation of cause and effect, one may experience a cause and then try to forecast its effect; or one may experience an effect and then endeavor to determine the cause. In either case one holds in mind the event experienced, and by means of attention searches either in the mind or among outward phenomena for another fact which will satisfy the mind as being the other term. For example, one experiences hot weather in summer. What is the cause of this? Since the earth receives its heat from the sun, hot summers must be due in some way to the relation of the sun to the earth. Influenced by other experiences with heat, the nearness of the earth to the sun may first be suggested as the cause of hot summers; however, this idea must be discarded, for as a matter of fact, the earth is farther from the sun in summer. Further search reveals the true cause to be that the angle at which the rays of the sun strike our section of the earth is more nearly vertical in summer.

With reference to the relation of the

particular to the general, the same passing of the attention from one thing to another takes place which results in the establishment of the relations of likeness, but there is an additional experience that quite transcends the sensing of other relations. To illustrate, one notices how the little brook which passes the door washes the dirt from the hills, distributing part along the submerged meadow land, and with the finer particles building a mud bank where it meets the current of the river. Other brooks are seen to do the same thing. The mind passing from one instance to each succeeding case senses the similarity (likeness) of the action of the water; then comes the exclusively human feat of mind; for, having sensed the similarity of action in the cases it *has* perceived, it, in imagination, passes to other instances *not seen* and generalizes, "This action is true of all rivers." This power to sense the relation of the particluar to the general extends one's knowledge from an experienced environment to the limits of the unseen.

This passing of the mind from the seen to the unseen is the exercise which the intellect needs in order to develop this human form of consciousness—the conceptual form. This can not be done by memorizing subject matter. The images of the individuals must be present to the consciousness in order that it may pass on to class consciousness.

This establishment of relations is important, not only from the psychological point of view, but also from the physiological point of view; for it is this exercise which tends to develop the brain cells and builds up the net work of association fibers which are necessary to mental development.

In this description of the relating processes, an important fact is to be noted, viz., the mind establishes relations (1) between the objects or events of the material world, (2) between the mental images of objects or events, (3) between objects and mental images taken together. This is an important distinction to make; for while the basis of our knowledge is

gained through means of objects or events, by far the greater part of it is gained through means of mental images.

The objects of the didactic material used in the Montessori System are of such a nature as to appeal to these tendencies in the earliest stages of their development. The accurate discriminations of the various relations, together with the names learned in connection with this material, provide the child with the means of continuing, unaided, his "explorations of the environment". The little child mentioned in Montessori's book, who discovered that the sky was "blue", had formed the relating habit, and had also acquired the words necessary to state the generalization she had spontaneously made. The names are a very necessary feature of the development of this tendency toward generalizing—the "outward generalizing" as Romanes calls it.

This objective relating goes on spontaneously in cases where the relations are quite obvious, but where the relation is obscure, the teacher sometimes finds it

necessary to aid the child in observing them through appealing to his mental images. This is always the case with regard to the lesson on units and tens place as mentioned above. The "oneness" of a group is not realized until similar instances such as, "1 class", "1 family", "1 army" are called to mind.

It is, however, in that stage of development when the mind, passing from the outward generalization, comes to the period of conception proper—that stage in which the mind passes from the knowledge of the seen to the knowledge of the unseen—that the establishment of relations between mental images begins to play a more important role in the process of gaining knowledge.

The awakening of this power is a great event in the life of the child. It is of great assistance to the child at this period to have him make use wherever possible of memory images instead of objects. For example, a conversation in which the child is led to tell his experience in seeing grocers and other merchants measure

various kinds of things is very helpful to the child in forming a conception of measurement. The use of memory images is one step toward imaging the unseen.

The movement of the mind in establishing relations between mental images is the same as in the case of objects, though the directing of the activity is quite different, being in the first instance a matter of determining the objects of the environment and in the second instance a matter of determining the mental images.

The problem of teaching is the problem of manipulating mental images

This is not so difficult as it may appear, although efficiency in this art requires study and practice (not practice on children, however). In the establishment of relations through means of mental images two things are to be considered, (1) the presence of images in consciousness, and (2) the establishment of the relations between these images.

The presence of ideas in consciousness

may be determined through means of the association of ideas.

The method of arousing mental images through the association of ideas is not to be confused with that in which the ideas are stated by the teacher. In dealing with large classes, the teacher must know that every child images the proper thing and experiences the required relations; otherwise both brain and mind development is retarded. If the *child himself states* the idea, the teacher judges with reason that he has the necessary images. (It is important to note at the outset, that it is sufficient for a child to express an idea in words that are *equivalent* to the correct words. The correct expression may then be substituted by the teacher.)

Through associated ideas, then, images are to be brought to the mind of the child. For example, take the idea of fractions.

The equivalent of this idea, *divided into equal parts*, is associated by little children with "sharing", so that, in order to get the child to image the idea of dividing, one

could ask, "If you wished to share your apple with some little friend, what would you have to do?" To which the child would reply, "I should have to divide the apple." In making this answer the child is obliged to image the dividing of the apple.

The "equality of parts" is associated with "being fair", so that if the teacher asks, "If you were very fair in dividing the apple, how would the pieces compare in size?" the child must mentally compare the two pieces, seeing the equality of them. In this illustration the teacher makes use of the memory image (associated idea) of "sharing", to get the child to sense the space relation of dividing, and she makes use of the memory image of "being fair" to get the child to sense the space relation of equality. It is important to note that in doing this questions were used to which each child *thinks* an answer.

The vital point in the problem of questioning is exemplified in each of these questions. "If you wished to share your apple with some little friend, what would you have to do?" The child images

himself and the other child and the apple; his mind then passes from the *one* apple to the *two* children and he answers, "I would have to divide the apple." The important point to be noted is that the *subject-matter of the question* expresses *the associated idea*, viz., "*sharing*", and not the relation, "*divided*". Similarly, in the question with regard to the equality of parts the subject matter expresses "being fair", the associated idea, not the relation *equal*.

The question which could be used to establish the fact that "the roots of the plant take up the water" may serve as another illustration. We will suppose that the teacher asks, "What part of the plant takes up the water?" But the children do not know this and so, through means of associated ideas, she then establishes the new relation. The two associated ideas are *pouring water on the dirt* and *the roots are down in the dirt*. The questions, then, would be "When we feed the plant where do we pour the water?" Image, "On the dirt." "What part of the

plant is down in the dirt?" Image, "The root is down in the dirt." Relation established (cause and effect), "The root takes up the water."

It is sometimes necessary to make use of mental images not so closely connected with the subject in hand as are those of the instances cited. Examples of such case may be seen in the use of illustrations in a lesson.

For example: take the case of the bee's wings being hooked together in flight. By the aid of the microscope the children have discovered the row of little hooks on the back wings and also the groove on the front wings into which they hook. They have also described the use of the wings in flying. The children can discover no reason for this arrangement and so through a similar case, though considerably remote, the teacher helps them to discover the effect of hooked wings. She asks, "How do people use their hands in swimming?" to which the children reply by showing the movement with their hands. The teacher then asks, "Why

do you not hold your hands so?" (indicating the fingers apart). The children explain that with the fingers apart, the water would go through (mental image) and one could not push so hard; after which the teacher asks, "Compare the case of the bee's wings. What would be true with regard to the air if the bee, in flight, beats the air with his wings apart?" The children, now, through the relation of likeness, see that the bee could "push better", this being the effect of hooking the wings together.

While the association here is somewhat more remote than in the previous examples, the principle is the same. The questions that embody the associated idea, call up the image of the act of *swimming with closed fingers*. The children are then asked to compare with this the act of *flying with closed wings*, which results in the discovery of the relation of likeness, and this explains the use of the hooks.

It is the custom of many teachers of methods in normal schools to forbid the use of questions "that can be answered

by 'yes' or 'no'." The fault with such questions lies in the fact that the subject matter of them *expresses the relation* instead of calling to mind the images between which the relation is to be *established by the children.* For example, in the above illustration, instead of the question given, the teacher would say, "When people swim they hold their fingers close together, do they not?" to which the children would answer, "Yes."

The habitual use of this form of question must affect the brain as well as the mind, for there is little, if any, establishment of relations in such cases. Especially is this true in connection with large classes.

Beside the questions used for the purpose of calling up images, the above illustration contains questions which call attention to the relation existing between the images. For example, the question. "Compare the case of the bee; what would be true with regard to the air if the bee, in flying, beats the air with his wings open?" This question calls attention to

the similarity of effect in pushing on the water with open fingers and in pushing on the air with open wings.

The relations of likeness and difference are generally discovered through means of comparing, and therefore it is usually most direct to ask the child to *compare* this with that.—"Compare the height of the windows with the height of the doors," "Compare the age of Mary with the age of Paul," "Compare the number of cents in a dime with the number in a nickle," "Compare the climate of England with that of Laborador." In answering each of these questions, the child is obliged to image the things related.

With regard to space relations, attention may be directed to those of position in many cases by asking, "*where*" such and such things may be. It must be noted, however, that these questions *must be limited* in order to avoid confusion of thought. For example, one may ask, "Where is the source of the Nile river *with regard to the heat belts of Africa?*"

"Where are the stamens *with regard to the petals*?"

Attention may be directed to time relations by asking "when" such and such things occurred. For example, "When was the battle of Bunker Hill fought with regard to the signing of the Declaration of Independence?"

Attention may be directed to the relation of cause and effect by asking "why" is this, or "what is the effect" of that.

In directing attention to the conceptual relation, i. e. to the thought of a class or of unseen cases, after the likeness of a few particulars, has been discovered, one may ask, "In how many of these cases is this so?" or "Think of a case where this is not so"—the negative form.

The vital points to be observed in questioning, then, are (1) in calling images to mind through association, the questions must express the associated idea; (2) in calling attention to relations, the kind of relation as to whether it be likeness or difference, space, time, cause and effect, or the particular to the general, will

determine the form of question to be asked; (3) questions must often be limited in order to avoid confusion of thought.

The questions given in the above illustrations are not the only ones that could be used in these instances but they serve to show that from the standpoint of establishing relations, the problem of questioning may be made definite and scientific. This fact is alone sufficient to commend this point of view.

Teaching, on this basis, is not easy, for it implies ability (1) to analyze subject matter, (2) to psychologize the subject matter; i.e. to state ideas in such order as the mind follows in assimilating them; (3) to determine what relations are to be established, and (4) what associations if any, are necessary; (5) to formulate such questions as will lead to the establishment of the relations; (6) to acquire such an intimate knowledge of the working of the mind that whatever the child says or does will reveal to her the state of the child's mind, and will furnish the "cue" for her own immediate proceedure.

But the tendency to establish relations is innate and works through its own initiative. The teacher should therefore be warned not to interfere with this activity by unnecessary questions. It is possible through the proper arrangement of subject-matter, and of the environment to aid greatly the process of auto-education and thus reduce to a minimum the necessity for direction. It is very important to remember that this form of activity as it becomes more and more developed, becomes more and more self-directive.

Application of the principle of auto-education to the higher grades would be greatly facilitated by classifying the pupils according to their special aptitudes as mentioned in Part IV. Preparation for a special line of work stimulates interests and impulses which lead to the acquisition of knowledge.

What is needed is the working out of a system of auto-education in a whole city, wherein, as a laboratory, observations of the development of the tendency to relate could be made in reference to all

grades and conditions, and also where the technique of teaching could be more definitely determined.

IV

THE REORGANIZATION OF A CITY SCHOOL SYSTEM

There is no question that such a reorganization of education as implied in the foregoing is now imminent. Ideals of education change with the changing ideals of life, and everywhere there is the call for greater freedom and efficiency.

The problem for our immediate consideration is how to make the forces which have created a demand for the change most effective in establishing the reorganization.

The minor changes in educational practices which have been made hitherto have been accomplished through means of individual schools. But why should we adopt that slow and wasteful method? Why not utilize the energy and enthusiasm necessary to effect the reorganization of one kindergarten or one grade in effect-

ing the reorganization of all the kindergartens and grades in a city? Surely if a new form of education is good for one school, it must be desirable for all. No more time is necessary for the reorganization of a city school system than for the reorganization of one school in such a system and the added impetus resulting from a community of interests would greatly aid the work. In fact the civic interests of the entire community should be centered upon the problem.

The following suggestions for the reorganization of a city school system are made with a view to utilize this community spirit in securing a more efficient system of education.

The reorganization of a school system based upon auto-education would affect the conduct of education most profoundly with respect to the curriculum, the methods of teaching, and the equipment of the schools.

The Curriculum

In developing a system of auto-education, the subject-matter of the curriculum

would have to be determined year by year, as it would be impossible to forecast definitely what the children, under this regimen would require, or what they would be capable of accomplishing. It is possible at this time, therefore, to give only the general characteristics of such a curriculum.

It is clear that the curriculum must provide a training for the relating and motor tendencies as well as to furnish knowledge. During the first years, the element of training predominates. As advancement is made, however, the knowledge element increases and the question of training is determined by the special aptitudes which the child has developed.

First period—3 to 6 years

The Montessori Method seems most perfectly adaptable to the needs of this period as these needs have been presented above.

The diadactic material, nature work, etc., provide opportunity for the exercise of the relating tendencies in the earliest stages of their development.

The development of the art instincts is important at this period and should be provided for—good music, color effects in pictures, flowers and other forms of beauty.

Second period—6 to 9 years

In this period, the curriculum should provide for the establishment of *definite space relations* such as are given in the denominate numbers tables. Such work follows naturally the *indefinite space relations* which have been gained through means of the didactic material in the previous period. The instincts of tool-using, planning, inventing, and experimenting should be recognized in the motor training. The artistic tendencies are to receive continued attention. The nature work, extended to the larger home environment gives increased opportunity for the establishment of relations of cause and effect and of the particular to the general which are to form the basis for future conceptual work in geography, history, etc.

Third period—9 to 12 years

In this period, further standards of measurement (denominate number tables) are acquired for use in establishing definite space relations. The technique of tool-using is acquired through the appropriation of "efforts stored by society" (modern ways of doing things and modern inventions). Training of artistic tendencies is continued. Conceptual tendencies are directed along the lines of science, mathematics, history, language, etc.

Fourth period—12 to 14 years

In this period the work is divided according to the special aptitudes of the children into such departments as literature and science, engineering and mechanical occupations, art and decorative trades, farming and agricultural industries, commerce and finance. The work of the higher grades should result in a body of related knowledge which is seen to have a pragmatic value. The above arrangement would greatly favor such a result.

Method of Teaching

While in this reorganization of education, the curriculum would differ somewhat from that now in general use, the greatest change would be experienced in the methods of teaching. Auto-education means "freedom to exercise one's natural tendencies in re-acting to a determined environment." Education through freedom is the direct opposite of education through control, and therefore, new methods of teaching are demanded.

In accordance with this demand, a plan for the reorganization of education must provide for; (1) the establishment of a training school for teachers, (2) the preparation of such teachers of the present corps as need or desire the training, (3) the introduction of the work into the grades.

While this would require several years for its accomplishment, it need in no way interrupt the normal efficiency of the schools. The entire change could be made

in a medium sized city in from four to six years. The following suggestion indicates one way in which this could be done.

Plan for Reorganization

First year—During the first year, the training school organized and the model school started, say the kindergarten, first, second and third grades opened. The kindergarten, first, second and third year teachers in the city schools take afternoon courses at the training school to prepare for the work.

Second year—During the second year, the organization of the model school continued. The fourth, fifth, and sixth year teachers of the city schools take afternoon courses to prepare for their work. The kindergarten, first, second, and third year teachers who were proficient, introduce the new work in their grades, the regular pupil teachers of the training school, assisting.

Third year—The new work started in the seventh, eighth, and ninth grades.

During the year that the regular teachers are preparing for the work they could be granted a one-session period for their teaching, spending the afternoon at the training school. This would be imperative, as the value of the system depends wholly upon the ability of the teachers to teach pedagogically. Beside certain courses dealing with modern views of life and mind, the work of these teachers at the training school would be, to gain the ability to teach according to the principles of Scientific Pedagogy, to study the subject matter of the new work, and to observe the same work as carried out in the model school.

Equipment

It is quite probable that few people go through life without experiencing an occasional change of ideals. These changes, however, generally come so gradually that one scarcely realizes what is taking place. Social intercourse, the newspapers and periodicals tend to bridge the gap between the old ideal and the new, so

that the latter is more or less familiar before one realizes that it has become established.

The reorganization of education as here suggested demands absolutely new ideals as the warrant of its acceptance. One must imagine the child not as forced into quiet and inaction by having to sit in a chair at a desk, but as actively trying to realize its own ideas. One must come to prefer the noise that results from a busy interested mind rather than the silence of repression; noise does not necessarily mean confusion.

The equipment of the schools should consist of such tools and material as are necessary in constructive work, such as carpenter's tools, gardening, cooking, and sewing appliances, and the usual equipment for the art work. The number of tools provided for each room need be only a small percentage of the number of pupils. As to material, there is enough wasted every year in any city to supply the schools bountifully, dry-goods boxes,

cigar boxes, tea chest leads, leather scraps, and innumerable other things that children and teachers in each section of the city could secure.

To start off with an expensive equipment that relieves everyone not of expense, but of the energy and wit in getting, things to work with, would deprive the children of an important part of the benefit of the work. The Spartans obliged their youths to steal their food. Stealing is not considered a virtue at present, but the principle of self-help is sound. One needs only what one can use, and the need should determine the supply.

The following details as to the equipment for the various grades are suggested:

Training school

The equipment of the training school is to provide for professional training, and for literary, scientific, industrial, and art courses. The manual training school should form the nucleus of the training school.

First, second and third grades

As a means of continuing into the first three grades, the method of auto-education of the kindergarten, the following details of equipment for these grades are suggested.

(1) A large, properly heated, lighted, and ventilated room.

(2) In one corner of this room a Montessori table fitted up as a carpenter bench with four each of planes, hammers and saws. Cases on wall for material.

(3) In another corner a Montessori table fitted up for cooking purposes, with four each of mixing pans, spoons and measuring cups. One gas burner for cooking; towels, dishpans, etc.

(4) In another corner a store fitted up with Montessori table for counter and furnished with all weights and measures. Also paper, pencils, paints, and other material used in the work of the grade.

(5) In the center of the room, a large sand table with boxes for sand and molding pans.

(6) One of the Montessori tables fitted up as a library table with suitable books and with drawers for pictures.

(7) A table fitted up with aquaria and to be used in connection with nature study.

(8) Black boards.

(9) Pictures and casts, etc.

(10) Some provision for furnishing the best music—possibly a good phonograph.

(11) Material for drawing, painting, and modelling.

(12) Garden—garden tools.

Fourth, fifth, sixth and seventh grades—rooms fitted up for study with special rooms for laboratories, worksohps, etc.

Eighth and ninth grade. Pupils classified according to special aptitude and assigned to appropriate departments as indicated above. Various grammar buildings could be utilized for this purpose. Also any technical or industrial schools in the city. If possible, a farm near the city should be secured.

The work of civic improvenemt to be carried on by the older pupils. This is to include home-making as well as city-making. It is intended that the relations between teachers and parents would be such as to warrant a practical application of the domestic economy taught through means of lunch parties and housekeeping parties held in the homes of the children.

The work of reorganizing a school system could be under the direction of either the principal of the training school or an assistant superintendent appointed for the purpose.

As to the expense of the reorganization, there are two ways in which it might be met. First, it might be done as the cathedrals of the Middle Ages were built, through the efforts of all the citizens centered in a common interest. This is, of course, the better way; but if it were not possible, then it might be done as the kindergartens were started, through the aid of public spirited citizens, who would finance the work until the system were complete, the city contributing its usual

yearly budget. The system could then be turned over to the city. The cost of maintaining such a system would not greatly exceed the present expense. Such a contribution to civilization as the reorganization of an entire city school system would be a gift worthy of any of our present philanthropists.

The importance of attempting the reorganization as here urged cannot be over estimated. Progress is made only as individuals, seeing a better way, courageously follow it. People are demanding the change. The question is, shall we wait for the slow methods of the past when individuals worked with small groups, or shall we adopt the methods of the present and demonstrate the principle on a scale that will prove its worth? People are accustomed to large enterprises and would gladly co-operate. In the coming era of Social Consciousness which is already supplanting that of Self-consciousness, the dominant note is *Mutual aid through co-operation.*